Fig. 36 is a schematic view of a model of metal/metal interface with good specular reflection thereon. In place of ordinary electron potential models generally employed in the art, herein used is an extremely simplified model for wave theory for facilitating the understanding of the invention. As in Fig. 36, when an electron having a predetermined Fermi wavelength has reached a metal/metal interface, then the wavelength of the electron shall change. In that condition, when the Fermi wavelength of the electron is shorter in one metal film, the reflective film p, than the other metal film neighboring on the film p, then the electron as reached the film p at an angle θ smaller than the critical angle θc ($\theta c > \theta$) shall be all the time completely reflected on the film p. With the difference between the Fermi wavelength of an electron in the reflective film p and that in the neighboring metal film being larger, the critical angle θ_C for the electron shall be larger, and, as a result, the mean reflectivity p as averaged for all electrons that participate in electroconductivity shall be larger.

Fig. 37A and Fig. 37B are graphs indicating the ratio of the Fermi wavelength, Λ(p), in the reflective film p to the Fermi wavelength, Λ(GMR), in a GMR film neighboring on the reflective film p, Λ(GMR) / Λ(p), versus the critical angle θc. As is known from Figs. 37A and 37B, the metal/metal interface could reflect electrons thereon to a satisfactory degree even

though the electron wavelength difference is not so significant. Needless-to-say, it is believed that the electron wavelength is infinite on a reflective film of an insulating material, and the critical angle θc for electrons on the reflective insulator film is large. However, even for metal/metal interface, electrons could reflect on the interface to a satisfactory degree. Fig. 38 is a graph of the data of the critical angle θc at which Au(Ag)/Cu interface produces specular reflection, as calculated from the Fermi wavelength at the interface. As is known from Fig. 38, the interface of Au(Ag)/Cu well produces satisfactory specular reflection thereon.

From the above, it is understood that, for the reflective film with metal/metal constitution, the important matters are that (1) the Fermi wavelength of electrons in one metal film is as long as possible and (2) the compositional steepness in the interface between the metal films is high. The Fermi wavelength is generally on the order of a few angstrom. Therefore, if the compositional steepness is lost owing to the interfacial diffusion over that order, the wave reflection will vary, depending on the wavelength, whereby the electron transmission probability will increase. Therefore, it is important how to increase the compositional steepness at the film interface and how to make the Fermi wavelength vary to a great extent on that interface. However, regarding (1), the

relationship between the Fermi wavelength and the specular reflection is not as yet clarified, and the Fermi wavelength is difficult to calculate. Therefore, it is not clear as to whether or not the condition (1) is indispensable herein. Therefore, we, the present inventors have herein decided that the condition (2) is indispensable to the present invention.

For satisfying the condition (2), it is especially important that the different metals in the metal/metal film constitution do not form solid solution when combined. If in the metal/metal system, metal precipitation occurs easily on the interface through annealing, it will much increase the compositional steepness in the interface to further facilitate specular reflection on the interface. Since the Fermi wavelength of electrons is naturally on the order of a few angstroms, it is desirable that the compositional steepness in the metal/metal interface is dull on that order. Regarding the point (1) noted above, it is desirable that a metal film with a shorter electron wavelength is disposed on the outer side of the magnetic layer while another metal film with a longer electron wavelength is on the outer side of the previous metal layer, for enhancing the reflectivity of the metal/metal film constitution.

From the above, for really ensuring the specular reflection on the metal/metal interface, it is understood that one practicable method of material selection for the